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A STUDY OF PRESENTATION AND MANAGEMENT OF COMPLICATED GROIN HERNIAS IN ADULTS

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CERTIFICATE

This is to certify that this dissertation entitled **"A STUDY OF PRESENTATION AND MANAGEMENT OF COMPLICATED GROIN HERNIAS IN ADULTS"** is the bonafide record work done by **Dr. A. LARIF** submitted as partial fulfillment for the requirements of **M.S. Degree Examinations Branch I, General Surgery, SEPTEMBER 2006.**

Prof. Dr.R.Marudavanan, M.S.,
Addl. Prof. And Unit Chief,
Department of General Surgery,
Thanjavur Medical College,
Thanjavur.

Prof.Dr.V.Thirugnanam,M.S.,M.Ch.,
Professor & Head of the Department,
Department of General Surgery,
Thanjavur Medical College,
Thanjavur.

THE DEAN,
Thanjavur Medical College,
Thanjavur.

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CONTENTS

INTRODUCTION

A hernia is defined as the abnormal protrusion of a viscus or tissue through a normal or abnormal aperture. Abdominal wall hernias of the groin include inguinal, femoral and obturator Hernias.

Groin Hernias are the most common type of Hernias. Several risk factors have been implicated in the development of groin hernias, including obesity, chronic cough, prostatic enlargement, pregnancy and perhaps most importantly aging, which studies suggest contributes significantly to the breakdown of tissues resulting in the development of some groin hernias.

Coughing (or) severe straining as occurs with constipation (or) prostatism frequently precipitates the clinical appearance of the hernia. Most groin hernias are clinically important and should be repaired electively, before they begin to enlarge. Any sudden increase in the size of the mass suggests incarceration or the development of a sliding component.

The risks of delaying surgery can be considerable, with the most important concern being the chance of developing complications like incarceration / irreducibility, obstruction and fatal strangulation of hernial contents. If this occurs emergency surgency is inevitable, regardless of the

patient's medical status, comorbid medical conditions or concomitant medications including the use of anticoagulants.

The mortality rate in a strangulated Hernia is related directly to the length of time of strangulation and the age of the patient.

Our study is intended to have a close look at the clinical presentation of the groin hernias which have proceeded on to complications and the best possible way of successfully managing the case with a background aim of preventing the recurrence of the disease.

AIMS AND OBJECTIVES

Aims of this study are to know the following

1. The incidence of Groin hernias presenting with complications
2. The contribution of obstructed groin hernias to the incidence of intestinal obstruction
3. The modes of clinical presentation of complicated Groin Hernias
4. The ideal way of managing a complicated Groin Hernia
5. Peroperative complications, if any
6. Ideal method of Hernia Repair
7. Incidence of Postoperative complications, if any
8. Follow up of the cases

REVIEW OF LITERATURE

HISTORY OF SURGERY FOR INGUINAL HERNIA

Hernia (Greek hernios, bud) is barely mentioned in the writings of Hippocrates (500 BC), the Father of Medicine. Neverthless, the condition is portrayed in Greek and Phoenician Statuary.

The Egyptian papyri do not contain reference to the operative treatment of hernia, but Papyrus Ebere (1552 B.C.) recommended diet and externally applied pressure (truss ?) for its treatment.

During the eighteenth century, Sri Percival Pott was probably the first to suggest the congenital origin of hernias.

Early in the nineteenth century, four men contributed important descriptions in inguinal anatomy – In 1801, Camper published the description of the fascia that bears his name. Sir Astley Cooper was the first to describe transversalis fascia, internal ring, inguinal canal, and correct formation of the femoral sheath by the transveralis fascia. Hesselbach described the triangle that bears his name in 1814. Scarpa described the superficial fascia that bears his name. He was also the first to describe a sliding hernia in 1821.

The nineteenth century brought anaesthesia, hemostasis and antisepsis, which allowed rapid advances of the science of hernial surgery.

It is to Marcy of Boston that the modern era of hernial surgery is credited. His understanding of the importance of the transversalis fascia and of the anatomic contribution of fascial repair of the internal ring was reported in 1871.

It remained for Bassini, who held the chair of clinical surgery at the University of Padua, to develop a technique for reconstruction of the inguinal floor with transposition of the cord. His operation (1884) included high ligation of the sac and reinforcement of the floor of the canal by suturing the transverus abdominis – aponeurosis to the inguinal ligament beneath the cord, thus placing the cord under the external oblique aponeurosis.

Independently and almost simultaneously, Halsted (1852 – 1922) developed an operation similar to that of Bassini. The Halsted I operation 1889) transposed the cord above the external oblique aponeurosis. The Halsted II operation did not transpose the cord but added imbrication of the aponeurosis of the external oblique muscle in performing the closure. The technique of imbrication is popular today and used regularly by devotees of the Canadian or Shouldice repair.

The use of the ileopectineal ligament (Cooper's ligament,ligamentum pubicum superius) to anchor the medial parietal wall in the repair is credited to Lotheissen of Innsbruck. The use of this structure is an integral part of the hernial repair made popular by McVay.

Harrison (1183 - 1962) was one of the strongest advocates of the transversalis fascia layer repair. A thickening in the transversalis fascia layer – the iliopubic tract – has been used in repair by a wide variety of surgeons – (Clark and Hastimoto, 1946; Donold, 1948; Griffith, 1959; Condon, 1964; Nyhus, 1964 and Howard, 1974).

In spite of all this, the last chapter in the history of groin anatomy and operative repair of hernia has not been written.

SURGICAL ANATOMY OF THE GROIN

The groin / inguinal Region is most often defined as the Transitional area in which the thigh and abdomen are joined. A portion of the aponeurosis of the abdominal muscles inserts in the inguinal ligament and blends inferiorly with the fascia lata of the thigh.

Subcutaneous Tissue:

The Subcutaneous fat consists of

1. The superficial fatty layer (Camper's fascia) which contains the superficial blood vessels and
2. The deep membraneous layer (Scarpa's fascia).

Innominate Fascia:

This well defined layer of investing fascia covers the external oblique aponeurosis externally and is firmly attached to the bone at the anterior superior iliac spine and pubic tubercle. At the superficial inguinal ring it gives rise to the external spermatic fascia.

Intercrural Fibres:

They are present in the lower portion of the innominate fascia just above and lateral to the superficial inguinal ring. They are variable in number and density, directed transversely at the apex of the ring. They serve to resist the spreading of the ring in instances of inguinal hernia.

External Oblique Aponeurosis:

This is the most superficial of the three flat musculoaponeurotic layers that make up the anterolateral wall of the abdomen. In the groin it is mainly aponeurotic, and the fibres and directed downwards, forwards and medially.

Superficial Inguinal Ring:

This is a triangular opening formed by divergence of the fibres of the lower part of the external oblique aponeurosis immediately above and lateral to the pubic tubercle.

Medial Margin	-	Medical crus – flat and broad.
Lateral Margin	-	Lateral crus – narrower
Lower Margin	-	Superior border of body of pubis
Apex	-	Bridged by the intercrural fibres.

Inguinal Ligament:

This is the lower thickened portion of and is continuous with the external oblique aponeurosis.

In the para sagittal section:

The lateral 1/3	-	Directed obliquely, outward and upward attached to anterior superior iliac spine and to the adjacent fascia of the ileo-pectineal arch.
The middle 1/3	-	Less thick, broader, has a lower free border. It is not attached to the underlying femoral sheath and can be easily separated from it by blunt dissection.

The medial 1/3 - Broad, nearly horizontal and is attached to the superior ramus of the pubis along the pectineal line and at the pubic tubercle.

Lacunar Ligament

The fan shaped medial expansion of the Inguinal ligament ; it is so named because of the depression (Latin: Lacuna (or) Cavity) formed in the ligament as it spans the area between Inguinal Ligament proper and pectineal ligament. It forms the most medial part of the floor of the Inguinal canal. It does not directly form medial border of femoral canal.

The Reflex (or) Reflected Inguinal Ligament

This, when present is formed by the medial fibres of the external abdominal oblique aponeurosis, which course medially from their attachment to the pectinate line and subsequently join the linea alba.

Henle's ligament

This thin ligament is found on the opposite (deep) surface of the rectus abdominis muscle that follows a course similar to that of reflected ligament and is not of major use in groin Herniorrhapy.

Falx Inguinalis and Conjoined Tendon

The medial aproneurotic fibres of the Transverse abdominis insert on the pecten pubis and the crest of the pubis, forming the Falx Inguinalis. (Latin meaning Inguinal sickle). These fibres infrequently (about 3%) are joined by a portion of the internal oblique aponeurosis; only then is a true conjoined tendon formed.

Internal Oblique Muscle and Aponeurosis:

This is mainly muscular in the inguinal region and its fibres are nearly transverse. Through much of its course this muscle is intimately attached to the underlying fibres of the transverses abdominis aponeurosis.

The fibres that arise from the inguinal ligament arch downwards and medially across the spermatic cord, become tendinuous and are directed transversly to the linea alba.

In only 3% of cases, these lower fibres turn more sharply downwards to join similar fibres from the subadjacent transverses aponeurosis to form the true conjoined tendon which inserts directly into the pubic tubercle and superior ramus of pubis.

Transverses Abdominis Muscle and Aponeurosis:

This is innermost of the three flat muscles. Its fibres are directed transversely which end in an aponeurosis and blends with the linea alba. The upper $3/4^{th}$ – lying behid the rectus abdominis and lower $1/4^{th}$ in front of it.

The lower fibres curve downwards. The lower border of the continuous portion of the transverses along with the transversalis fascia forms the transversus abdominis arch which is the superior border of the lateral part of most direct inguinal hernias. These fibres insert into the crest and pectin of the pubis.

Transversalis Fascia

It is now generally accepted that the Transversalis Fascia can be considered to consist of two laminae. The deep lamina (i.e) the more postr Lamina – is composed of irregularly thickened stands of Fibrous tissue intermingled with loculi of adipose Tissue. This layer is readily separate from the peritoneum and is often referred to as the preperitoneal fascia. The postr. Lamina is anchored inferiorly to the pubic ramus.

The anterior lamina of transversalis fascia is applied to the postr aspect of the transverse abdominis muscle and its aponeurosis. The area between the parietal peritoneum and the anterior lamina of the Transversalis Fascia is designated **Bogros space.**

Transversalis fascia Analogs

- **The Iliopubic Tract**

This is an aponeurotic band forming the inferior margin of the transversalis fascia, which is mixed with stronger fibers from transverses abdominis aponeurosis. It is anchored superolaterally to the medial iliac crest and stretches medially to insert on the pubic. It has become an important landmark to the surgeon using laparoscopic techniques since it is beneath this ligament that many of the branches of the lumbar plexus exit the pelvis after running deep to iliacus fascia.

- **The iliopectineal arch**

This is comprised of the condensed medial fibres of the iliacus fascia which is a named portion of the Transversalis fascia. It forms a band of connective tissue between the lateral Neuromuscular compartment containing the iliopsoas muscle, and the femoral and lateral femoral cutaneous nerves and medial compartment containing the femoral vessels.

- **The Femoral Sheath**

This and its constituent parts are, for the most part, derivatives of the Transversalis fascia. Anteriorly and medially, the walls of the sheath are formed by the Transversalis fascia that is continuous with the iliopubic tract. Posterolaterally, the sheath is formed by a continuation of the iliopsoas portion of the Transversalis fascia. Posteromedial wall of the sheath is derived from

the pectineus fascia and the iliopectineal arch. The anterior and posterior walls of the sheath fuse inferiorly with the adventitia of the vessels. It is divided by septa into a lateral arterial compartment, intermediate venous compartment, and the medially placed femoral canal.

Deep Inguinal Ring

The Transversalis fascia near the deep ring is the source of the internal spermatic fascia. In addition to the internal spermatic fascia and the Testicle, the deep ring transmits the constituents of the spermatic cord; the ductus deferens, Genito femoral Nerve, pampiniform plexus of veins, testicular artens, cremaster fibers derived from the internal abdominal oblique muscle and the external spermatic fascia.

Deep Inguinal and Abdominal Wall Vasculature

The primary blood supply to the lower part of the anterior abdominal wall is from the inferior epigastric artery. It is a branch of the external iliac artery. The Infr. epigastric artery may give off a branch called the aberrant obturator artery, which may either replace (or) accompany the obturator branch of internal iliac artery into the obturator canal, when both arteries are present a circle often called the **"Corona mortis"** is formed. This omnious title points to the frequent injury of this vessel.

FEMORAL CANAL

This is found just medial to the femoral vein. The canal contains loose connective tissue and typically a lymph node – cloquets. The canal is most likely present to allow space for sudden expansion of the femoral vein. The orifice of the femoral canal is a complex cresent moon shaped structure called the **Femoral Ring**. The anterior border of the Ring is formed by the iliopubic Tract; the medial aspect of the ring is completed by the recurved fibres of iliopubic tract that blend with the pectineal ligament and fascia. The postr part of the ring is formed by the pectineus fascia and the superior ramus of the pubis. It is about 2 cm long and may be sealed by a weak membrane.

EPIDEMIOLOGY OF GROIN HERNIAS

Inguinal Hemias are more common in males than females, in a ratio of 8 : 1 (or) 20 : 1 in different series. In the literature, the incidence. varies depending on the source of the count. Approximately 94% of hernias among males are estimated to be in the inguinal Region. 95% of Inguinal Hernia operations are on males. 3 Times more Females undergo femoral Hernia operations than male.

By the age of 75 yrs, 10 – 15% of males have already received inguinal hernia surgery. 65% of inguinal hernias in adult are indirect in type.

Right sided inguinal Hernias in adult males are slightly more frequent than left sided; 55% occur on the right, regardless of whether the hernia is indirect (or) direct. Bilateral Hernias are 4 times more often direct than indirect.

In Western series, the peak incidence of groin Hernias is in the 6^{th} decade. The true prevalence of Inguinal Hernias can be estimated only by community based epidemiological studies, the validity of which will depend on the diagnostic criteria used.

Femoral Hernias are less common than inguinal and account for only 10% of all groin Hernias.It is more frequent in females than males in the ratio of 2.5:1 (Maingot 8:1). In a series 40% of femoral Hernia are admitted as emergency cases with strangulation (or) incarceration. Females undergo 3 times more femoral hernia operations. It is rare in those under 39 and is most common in multiparus women.

ETIOLOGY OF GROIN HERNIA

CONGENITAL FACTORS

BIOLOGICAL FACTORS

IATROGENIC FACTORS

CONGENITAL FACTORS

They are the most important causes.

1. Unobliterated processus vaginalis :

If the processus vaginalis fails to obliterate at brith, an indirect inguinal hernia results. The peak incidence of hernia is during infancy, when about 50% of boys have a patent processus vaginalis.

2. **Congenital high arching lower border of transverses abdominis aponeurosis :**

Such patients are at risk of developing a direct hernia which occurs between the pubic ramus and the arching border of the transverses abdominis muscle medial to the deep inferior epigastric vessels.

3. Low pubic tubercle

The distance of the pubic tubercle is an important factor in the development of hernia in the inguinal region; probably it causes a weaker inguinal triangle. This is because, the distance of the public tubercle to the bi-

crestal line is greater in individuals who develop hernia than in normal subjects.

BIOLOGICAL FACTORS

1. Abnormality of local collagen metabolism:

Collagen is the normal and major constituent of the various aponeurosis and fascial structures of the body. Normally, there is a constant synthesis of collagen which is matched by a parallel rate of degradation.

Peacock and Madden in 1974, compared and rates of collagen synthesis and lysis in both inguinal areas – in the transversalis fascia medial to the contralateral internal ring, in patients with unilateral hernias. They found that the rates of both processes were markedly increased. Further, there was a frank decrease in the hydroxyproline level in patients with groin hernias and these decreased amounts did not relate to age or muscle mass. (Hydroxyproline is the major aminoacid constituent of collagen.

2. Malnutrition :

The specific effects of malnutrition on the evolution of hernias of the groin are as yet undefined, but there are few:-

a) **Scurvy :**In olden days, patients with scurvy were reported to have hernias or ruptures of healed scars. Later a specific effect of Vitamin-C on collagen maturation was described.

b) Lathyrism : This results from ingestion of the flowering sweat pea (Lathyrus sativus). The active principle of this plant i.e. B-oxalyl amino alanine prevents the maturation of collagen and is capable of causing groin hernias in young rats and mice. (Conner and Peacock, 1973).

3. Environmental toxins :

Cannon and Read (1981) found that smokers had the potential undesirable combination of increase in proteolytic activity and reduction in alpha 1 antitrypsin – the major naturally occurring circulating antiprotease.

This combination could set the stage for the evolution of a hernia by affecting the synthesis – degradation equilibrium of groin collagen and could be a pathological sequence of excessive smoking.

4. Athletics :

People who perform repeated strenuous physical activities offer another example of hernias produced by a combination of predisposed anatomy and situational stress.

IATROGENIC FACTORS :

1. Appendicectomy

Hoguet in1911, first described the development of Inguinal Hernia in pts, who had undergone previous appendectomy. Right Inguinal Hernias are

more frequent when appendectomy is performed through a lower, more cosmetic incision, which is placed below the antr. Supr. iliac spine and in which the Iliohypogastric nerve is injured. There is no evidence that Inguinal Herniation is a consequence when standard McBurney incision is used. In a series of 549 pts who had undergone Inguinal Hernia Repair the percentage incidence of Previous appendicectomy in right sided Hernias 8.9% $\pm$ 1.7%, left sided Hernia 11.2% $\pm$ 2.1%.

2. Chronic Ambulatory Peritoneal Dialysis (CAPD):

There is a growing evidence that the increased hydrostatic intraabdominal pressure associated with CAPD frequently results in a hernia.

However since renal failure per se has a deleterious effect on collagen metabolism, there is a possibility that a multifactorial pathogenesis is operating.

3. Hernias related to Osteotomy

Surgical Innominate osteotomy is done in children with congenital dislocated Hips. The hernia following innominate osteotomy is either a direct inguinal Hernia, a prevascular femoral (Naraths) Hernia (or) Combination of the two. This procedure leads to an increase in the distance between the edge of the Rectus abdominis muscle and the inguinal and pectineal ligaments. This leads to consequent weakening in the postr. Wall of Inguinal canal.

CLASSIFICATION OF GROIN HERNIAS

TRADITIONAL CLASSIFICATION

Indirect Inguinal

Direct Inguinal

Femoral

HALVERSON AND MCVAY CLASSIFICATION

Small, Indirect

Medium, Indirect

Large, Indirect and Direct

Femoral

Combined – any mixture of above

GILBERT CLASSIFICATION WITH ADDNS OF RUTKOW & ROBBINS

I Indirect small

II Indirect medium

III Indirect large

IV Direct entire floor

V Direct Diverticular

VI Combined Indirect & Direct

VII Femoral

NYHUS CLASSIFICATION

Type I Indirect small

II Indirect medium

III A – Direct

B – Indirect, large

C – Femoral

IV Recurrent

A – Direct

B – Indirect

C – Femoral

D – Combinations of A, B, C

BENDAUID TSD CLASSIFICATION (Type, Staging, Dimension)

Type - Anterolateral (Indirect)

Anteromedial (Direct)

Posteromedial (Femoral)

Postero lateral (Perivascular)

Stage I. Sac in Canal

II Sac outside external Ring

III. Sac into scrotum

Dimension - Orifice maximum in cm

UNIFIED CLASSIFICATION

I	-	Indirect, small
II	-	Indirect, medium
III	-	Indirect, large
IV	-	Direct, small
V	-	Direct medium
VI	-	Direct large
VII	-	Combined – Pantaloon
VIII	-	Femoral
O	-	Others
		(Any not classified by No above
		Femoral + Indirect (or) Direct
		Femoral + Indirect + Direct
		Massive > 8 cm (4 fingers) Inguinal Defect
		Prevascular)

REPAIR OF GROIN HERNIA

INGUINAL HERNIA REPAIR

CLASSICAL BASSINI'S OPERATION:

This was described by Eduardo Bassini in 1884. Bassini's operation epitomized the essential steps for an ideal tissue repair. He opened the external oblique aponeurosis through the external ring, resected the cremasteric fascia to expose the spermatic cord, He then divided the canal's posterior wall to expose the preperitoneal space and did a high dissection and ligation of the peritoneal sac. Bassini then reconstructed the canal's postr. wall in 3 layers. He approximated the medial tissues, including the internal oblique muscle, transverses abdominus muscle and transversalis fascia to the shelving edge of the inguinal ligament with interrupted sutures.

CONTEMPORARY CLASSICAL REPAIRS

Among the most notable contemporary classic hernia repairs are the Modified Bassini, Halsted, Shouldice and Mcvay (Cooper Ligament) Repairs.

MODIFIED BASSINI

Here the repair of the posterior wall is done without opening. Done with 1 prolene Suture Material. The Inguinal Ligament below, the conjoint tendon and internal oblique aponeurosis above are completely exposed and cord is lateralised. The First stitch is taken from the periosteum of the pubic tubercle

below to the conjoint Tendon above, each stitch being about 0.5cm lateral to the preceeding stitch. This is carried out laterally up to the deep ring. The interrupted sutures are then tied.

TANNER'S MUSCLE SLIDE

A Curved incision made on the aponeurosis of the internal oblique and transversus where they form the anterior rectus sheath. This is done sometimes when the repair is under tension.

DARNING

A darn Repair includes plication of the Transversalis fascia supplemented by a loose weave of interlocking suture material between the conjoint tendon and the inguinal ligament. Darning done without leaving much space gives appearance of a mesh. If stiches are taken without locking, they are bound to loosen. Over tightening can lead to tension. Hence the need for a relaxing inclusion in such cases.

SHOULDICE REPAIR

This Technique was developed at the shouldice Hospital in Toronto, Canada by Dr. E. E. Shouldice and his co-workers in 1950. Traditionally sutures were made of stainless steel wire, but polypropylene sutures, which are easier to handle, can be used. This method involves division and resection of

the cremaster muscle. The Transversalis fascia just medial to the internal ring is elevated and divided for the whole Length of the inguinal canal down to the pubic tubercle. The flaps of the transversalis fascia are lifted up and, using a double breast Technique, the Transversalis reconstituted. In randomized controlled trials, the shouldice repair has been found. to give lower recurrence rates than other suture Techniques.

HALSTED OPERATION

Like Bassini, Halsted opened the canal's posterior wall to do a High dissection and Ligation of the peritoneal sac in the iliac fossc. He made a point to thin the cord as much as possible and then did a 4 layer repair of the canal's posterior wall.

MCVAY REPAIR (COOPER LIGAMENT REPAIR)

This was revived by Chester. B. McVay Chairman, Univ. of South Dakota, Vermillion, USA. Done when all or a large portion of the posterior inguinal canal has been destroyed by Hernia. The Cooper's Ligament or superior pubic ligament is the normal insertion of the posterior inguinal wall. All Fascia and apareurosis attenuated by the hernia should be excised. A relaxing in cision is made, so that the strong edge of the transversus abd. apaneurosis is sutured down to the Cooper's Ligament with a series of

interrupted Silk sutures about 8 - 10 each 3mm apart. This is a time consuming procedure, requiring longer duration of anesthesia.

HERNIA REPAIR USING PROSTHETIC MESH

Prosthetic mesh has become increasingly popular for repair of inguinal hernia. The Lichtenstein Technique uses a patch of polypropylene mesh approximately 8X16 cms, tailored to the individual patient's anatomy. The mesh is trimmed and a slit is made at its lateral edge, creating two tails, an upper and a Lower. The mesh is sutured to the inguinal Ligament below, and to the conjoint tendon above, using polypropylene. The tails of the mesh are both secured to the Inguinal Ligament. The mesh has been found to shrink by as much as 20 percent as the fibrous Tissue contracts, so it is important to use a mesh of more than adequate size.

LAPAROSCOPIC REPAIR

The first laparoscopic Repair was performed in 1979, since then this method has been adopted by many : Initial Repairs closed off the internal ring with sutures, but due to the high recurrence rates Laparoscopic repairs now use mesh to repair the defect. There are two main Techniques;

TAPP -Trans Abdominal Preperitoneal

TEP - Total Extra Peritoneal.

General anesthesia is required for laproscopic Repair. The trans abdominal preperitoneal technique involves insertion of the laparoscope in to the peritoneal cavity and dissection of the Hernia by elevating the peritoneum behind Hasslebach's Triangle. Polypropylene mesh is inserted to repair the Hernias; it may be secured with staplers (or) sutures after the repair. The peritoneum is closed over the operation site.

The Totally extraperitoneal approach does not involve insertion of the laparoscope into the Peritoneal cavity, the dissection in this approach is in the extraperitoneal plane. Mesh is used to repair the hernia once the sac has been reduced; there is no need to secure the mesh.

The laparoscopic approach has the advantage of fewer wound complications and an earlier return to normal activities. The operation is more expensive, as it involves a longer operation time and also often uses disposable equipment. It is technically demanding and has a steep learning curve.

FEMORAL HERNIA REPAIR

Open Repair for femoral Hernia includes 3 approaches:

The low approach of Lockwood,

Trans Inguinal approach of Lotheissen

High approach of McEvedy.

The principal is the same in all; dissection of the sac; inspection of the contents, ligation of the sac and Hernia repair, usually with sutures to approximate the inguinal and peetineal ligaments.

THE LOW APPROACH

It has been advocated for elective repair when the contents of the sac are viable, it is simple and easy. A transverse (or) skin crease incision is made over the lump in femoral region. It may be necessary to make an incision in the lacunar ligament to relaease its neck when it is difficult to reduce contents.

TRANSINGUINAL APPROACH

This Technique involves a standard oblique groin incision above and parallel to the inguinal ligament. The femoral hernia is approached by opening the transversalis fascia at the back wall of the canal. This Technique is less popular as it is thought to weaken the inguinal canal.

HIGH APPROACH

This approach is generally considered the optimum method for strangulated femoral Hernia. Classically an oblique or Paramedian skin incision is made. The rectus sheath is then opened longitudinally and the rectus muscle retracted medially. The traneversalis fascia can then be pushed away from the inguinal ligament to expose the femoral canal. If the sac is empty it can be

withdrawn in to the abdomen and the hernia repaired from above by approximation of the inguinal and pectineal ligament using non-absorbable sutures. If hernia sac cannot be reduced, the peritoneum is opened and by gentle traction from above, the contents are withdrawn from the sac. If there are still difficulties, division of the lacunar ligament can be done.

LAPAROSCOPIC REPAIR

Femoral hernia can be repaired laparoscopically either by a transabdominal (or) extra peritoneal approach. However the laparoscopic operation require extensive dissection and has to be done under general anesthesia. At present there is no evidence to suggest that it is more efficacious than the open repair.

PLUG REPAIR

Plugs of mesh can be inserted in to femoral canal to repair the hernia, this has been found to give low rates of recurrence, but migration of the mesh and infections, which are thought to occur more commonly when mesh is rolled up have been described.

COMPLICATIONS OF HERNIA IN GENERAL

INCARCERATION/IRREDUCIBILITY

Incarceration is the state of an external Hernia, which cannot be reduced in to the abdomen. It implies increased risk of obstruction & strangulation Incarceration is caused by

(a) Tight Hernial sac neck

(b) Adhesions between the hernial contents and the sac lining – these adhesions are sometimes a manifestation of previous ischemia and inflammation.

(c) Development of pathology in the incarcerated viscus. (e.g) a Carcinoma (or) diverticulitis in incarcerated colon.

(d) Impaction of feces in an incarcerated colon.

If Reduction is attempted ; should be gentle. Forcible reduction may precipitate **reduction – en- masse**.

OBSTRUCTION

This is an irreducible hernia containing loops of intestine which is obstructed from within or without; but there is no interference to the blood supply.

STRANGULATION

Major life threatening complication of groin Hernias.

The Blood supply to the Hernial contents is compromised. At first there is angulation and distortion of the neck of the sac ; this leads to lymphatic and venous engorgement. The Herniated contents become edematous. Capillary vascular permeability develops. The arterial supply is occluded by the developing edema and now the scene is set for ischemic changes in bowel wall. The gut mucosal defenses are breached and intestinal Bacteria multiply and penetrate through to infect the Hernial sac contents.

In Western studies the average annual incidence of strangulated Hernia is 13/100000 popln. There are significant seasonal variations, the condition being most prevalent in the winter months (Oct to March). Perhaps this is association with coughing related to Resp. Tract Infections which are more prevalent in winter. The age incidence shows a peak in the very young, then a low incidence rising to peak in the 8^{th} decade. Male predominate until the 75^{th} year, after which females present more frequently. Right sided Hernias strangulate more frequently than left sided Hernias ; this is possibly related to mesenteric anatomy. Strangulation in adults is more likely in femoral, Incisional and Recurrent Inguinal Hernias rather than primary inguinal Hernias.

40% of pts. with femoral hernia are admitted as emergency cases with strangulation (or) incarceration, whereas only 3% of pts with direct inguinal Hernias present with strangulation.

In a pt over the age of 60 yrs, a strangulated hernia has a 20 fold increased risk of death compared with elective Repair.

Reduction – en – masse (Mass Reduction)

Refers to Reduction of external Herniation with continued incarcerated (or) strangulation of the internally prolapsed Hernial contents. Common with Indirect than direct inguinal Hernia and femoral Hernias. This condition was first described by Saviard in 1702, who reported a postmortem examination of a patient who had died following successful Taxis for a femoral Hernia.

MAYDL'S HERNIA AND AFFERENT LOOP STRANGULATION

In 1895, Maydl described the hernia-en-W(or) double loop hernia in which segments of Bowel proximal and distal to an infolded loop become incarcerated within a hernial sac but without loss of viability. However the infolded (or) intraabdominal loop may become infarcted by strangulation even in presence of viable loops incarcerated in the Hernial sac. It is commonest in men and commonest on right side. Maydl's Hernia can also occur after laparoscopic operations by Herniation of small Bawel thro' a trocar site. Both small and large Bowel are found in these Hernias.

Afferent loop strangulation is a complication in which intra abdominal strangulation of small intestine occurs proximal to an obstructed Inguinal Hernia. The afferent loop is usually imprisoned behind the cecum, which is obstructed in the Inguinal Hernial sac.

RICHTER'S HERNIA

Partial enterocele, the eponymons Richter's Hernia was not first described by Richter but by Lavator in 1672. In the partial enterocele, the antimesenteric circumference of the intestine becomes constricted in the neck of a hernial sac without causing complete intestinal luminal occlusion. It is most frequently found in femoral & obturator hernias. Recently this has come in to prominence as a complication of CAPD, used in the treatment of Renal failure and as a complication of port site Hernia following laparoscopy.

Colic and distension occur, but absolute constipation for feces and gas is a late phenomenon. Vomiting is also often absent.

LITTRE'S HERNIA - HERNIA OF MECKEL'S DIVERTICULUM

Meckel's Diverticulum is the most common congenital anomaly of the GIT arising as a result of incomplete dissolution of the vitello intestinal duct. Approximately 4% of patients with meckel's diverticulum develop complications, littre's hernia being least common. It was described by Alexis Littre in 1700. It has been described in incarcerated Inguinal Hernia in infants. In Infants the diverticulum frequently becomes adherent to the sac and as a

consequence the Hernia becomes irreducible. It is also described in femoral Hernia, a most unusual variant is the presentation of the diverticulum as a small Bowel fistula resulting from strangulation of diverticulum.

SLIDING HERNIA

In a sliding hernia part of the sac wall is formed by the prolapsed viscus.

The classical description of the condition was done by Scarpa 18^{th} . The most frequent sliding Hernias are the cecum and appendix in indirect right Inguinal Hernias and the sigmoid colon in indirect left Inguinal Hernias. Bladder, Fallopian Tubes and Ovary are also described as components of sliding sacs.

Moschowitz and Ponka described 3 most common intra operative mistakes that bedevilled surgical intervention for sliding Hernias. These are

(i) Designating a Hernia to be sliding when it is merely a simple Hernia in which loop of intestine is adherent to sac.

(ii) Haemorrhage caused by attempting to dissect the viscus (colon (or) Bladder) from its Blood supply.

(iii) Accidental entry into Bladder (or) Viscus particularly during mobilization of the sac wall

RAPTURE OF HERNIA – SPONTANEOUS(OR)TRAUMATIC

Spontaneous rapture (Dehiscence) of Hernia is a well recognized though rare complication, majority occurring in lower abdominal, Inguinal and incisional Hernias. Many develop insidiously while others are associated with episodes of straining (or) coughing. The dehiscence would appear to be a degenerative process, with the relatively avascular and thin hernial sac undergoing progressive stretching, becoming increasingly ischemic and finally giving way. This process is accelerated in some cases by skin ulceration due to Tight corsets (or) to intertrigo and skin infection in pendulous sacs. The main peritoneal cavity is uncontaminated, the Tight neck usually preventing reduction of the contents and contamination.

Traumatic Rapture is not excessively rare. There is an association between small Bowel rapture due to blunt Trauma and Inguinal Hernia. It is more likely to occur when a hernia is down (or) in the presence of a voluminous incarcerated. Inguino – scrotal Hernia. Direct violence to the sac causes local damage to intestine. Alternatively, the force of the blow first opposes the walls of the incoming and outgoing Bowel, sealing the loop. The additional pressure applied raises the loop's intraluminal pressure to the point that Traumatic perforation occurs.

INVOLVEMENT OF HERNIAL SAC IN DISEASE PROCESS

These include

1) **Nodular Mesothelial Hyperplasia**
2) **Malignant Mesothelioma Derived from the peritoneum**
3) **Carcinoma of Hernial sac.**

(A) Primary Carcinoma

a. ***Extra Saccular:*** Can arrive from the Bladder (or) Diverticulum of the bladder (or) from colon that is forming the component of the wall of a sliding Hernia.

b. ***Intra Saccular :*** Primary carcinoma arising from an organ which is a permanent content of hernial sac mostly colon / ceacal cancer.

(B) Secondary Carcinoma

Predominantly intra saccular derived by metastatic spread from lung, Breast, stomach, colon, ovary (or) any other intraperitoneal viscus.

(4) Hernial appendicitis (Amyand's Hernia)

This usually occurs in a right Inguinal (or) right Femoral Hernia and in cases of perforated appendix is often misdiagnosed as a strangulated groin Hernia Claudiu’s Amyand performed the first successful appendectomy in 1736, which was contained in right Inguinal Hernia. The differential diagnosis is a Richter’s Hernia (or) strangulated omentum. Pain in both these conditions

is classically continuous and penetrating, whereas in early appendicitis periumblical colic is a typical feature.

5. Testicular strangulation

The Testicular blood supply is compromised when a Tight strangulation compresses it in its passage from the abdomen to scrotum. Occurs in 3 circumstances.

1. In male infants with incarcerated Inguinal Hernia, the venous drainage becomes obstructed at the rigid external ring.
2. In giant Inguinoscrotal Hernia, Spontaneous infarction of testicle is described.
3. In Africans, in the strangulated indirect Inguinal Hernia, Testicular infarction due to vascular obstruction at the deep ring is reported.

It is important to differentiate the diagnosis from that of Testicular Torsion. In either event, however, surgery is required.

MANAGEMENT OF COMPLICATED GROIN HERNIAS

OBSTRUCTED AND STRANGULATED HERNIAS

Diagnosis is based on symptoms and signs supplemented by Abdominal radiographs when indicated. Symptoms include colicky abdominal pain, distension vomiting and constipation.

Physical examination reveal degree of dehydration with (or) without CNS depression (Uremia in elderly) and Abdominal signs of Intestinal obstruction.

Physical Examn. alone is insufficiently accurate to confirm the presence of a strangulating femoral Hernia versus lymphadenopathy versus a lymphnode abscess. In these instances, radiographic studies such as an ultrasound (or) a CT scan can be done on emergent basis. And X-ray will point up stigmata of intl obstrn. : dilated loops & fluid levels.

Preoperative Lab Investigations

Full Blood count to assess Leukocytosis as an indicator of Intestinal infarction.

Hematocrit to assess Hydration

Blood Biochemistry. – Electrolyte imbalance (or) Raised creatinine and urea may reveal features of dehydration

In elderly chest Radiograph and electrocardiograph may be needed for preoperative monitoring.

Initial Resuscitation is essential to bring the laboratory parameters in line for safe anaesthesia. Treatment begins with nasogastric suction, Bladder catherisation and intravenous fluid replacement Broad spectrum antibiotics to cover both Gram negative and Gram positive organisms. The period of Resuscitation must be finely Judged, the merits of optimizing the patient's state of Hydration, electrolyte Balance and Cardiopulmonary status must be balanced against the systemic Toxic complications of unresected , infracted bowel.

Anaesthesia

The choice of anesthesia is dependent upon the general fitness of the patient, patient preference and the skills of the surgeon (or) anaesthetist. Nevertheless, a bowel resection and anastomosis is always more safely performed through a peritoneal route, this operation should be carried out under general anaesthesia Alternatives include Regional anaestheia (epidural (or) spinal) and rarely local anesthetic. Inflamed skin and tissues overlying strangulated Hernial sacs have a low pH and local anesthetic solutions may be ineffective.

Incision

The choice of incision will depend on the Type of groin Hernia if the Diagnosis is confident. When the Diagnosis is in doubt, a half pfannensteil incision 2cm above the pubic ramus, extending laterally, will given an adequate approach to all types of femoral (or) Inguinal Hernia. The fundus of the Hernia sac can then be approached and exposed and an incision made to expose the contents of the sac. This will allow determination of the viability of its contents. Non viability may necessitate conversion of the Transverse incision in to a Laparotomy incision followed by Release of the constricting Hernia Ring, reduction of the contents of the sac, Resection and Reanastomosis. Precautions should be taken to avoid contamination of the general peritoneal cavity by gangrenous bowel (or) Intestinal contents.

In the majority of cases, once the constriction has been released, circulation to the intestine is reestablished and viability returns. Intestine that is initially dusky, a peristaltic (or) dull in hue may pink up with a short period of warming with damp packs once the constriction band is released. If viability is doubtful, resection should be performed. Resection rates are highest for femoral (or) Recurrent Inguinal Hernias and lowest for Inguinal Hernias. Other organs such as Bladder (or) Omentum, should be resected as the need requires. After peritoneal lavage and formal closure of the laparotomy incision, specific repair of the groin Hernia defect should be performed. In this situation, prosthetic mesh should not be used in an operative field that has been

contaminated and in which there is relatively high risk of wound infection. The Hernia repair should follow the general principle for elective Hernia repair. For Recurrent Groin Hernia and Femoral Hernias, the preperitoneal approach is the prefered method.

Reduction en masse

In all cases of Reduction – en – masse, although the external Hernial mass has gone, palpation of its egress site will demonstrate the empty Ring with adjacent Tenderness. Gentle palpation of the nearby abdomen will reveal the globular obstructed viscera in it. The symptom of obstruction will persist. Operation thro an extraperitoneal approach to the groin will allow simultaneous Hernia Repair if the Hernia is inguinal (or) Femoral in Type. The use of preoperative CT scan may obviate the need for extraperitoneal approach. The use of diagnostic laproscopy may provide excellent visualization of the reduced Bowel.

Maydl's hernia/ Afferent loop strangulation.

As a precaution, the surgeon should always count the loops in the sac and inspect the gut for 1 meter proximal and distal. The use of the laparoscope in this type of patient would relieve any doubt about the viability of the bowel if this exists.

Sliding Hernias

The cord structures are carefully dissected away from the sac up to and in to peritoneal cavity and excess peritoneal sac is excised and closed. The hernia and its contents are then returned to the abdominal cavity. The Transversalis fascia is carefully reconstructed to contain, the Hernia and refashion the deep ring around the cord. It is desirable to perform orchidectomy in order to effect a secure repair.

Laparoscopic diagnosis & repair of sliding Hernia is much easier. The TAPP method of repair is sometimes preferred to TEP method because of the occasional difficulty in reducing the contents.

COMPLICATIONS OF HERNIA REPAIR

PEROPERATIVE COMPLICATIONS

(i) Haemorrhage

It may occur due to Trauma to

a) Pubic branch of obturator. A (corona mortis)

b) The deep circumflex iliac vessels.

They may be injured by placement of sutures too deeply through the iliopubic tract, during repair at the lateral side of the deep ring.

Remove the suture and apply pressure for control.

c) The inferior deep epigastric vessels – it can be ligated.

d) The Cremasteric Artery.

e) The external iliac vessels – They are injured when sutures are placed too deeply in to the anterior femoral sheath, iliopubic tract (or) Inguinal Ligament.

(ii) Injury to Vas deferens

The vas deferens should only rarely be damaged during primary hernia repair in adults. May be asymptomatic. Fever, Tenderness and swelling of the testis occur in 2/3 cases which subsides in few days. It is advocated that vas Transection in young should immediately be repaired using a magnifying loop or microscope to achieve adequate end to end apposition with a row of circumferential suture of very fine prolene.

(iii) Severance of Nerves

1. ILIOINGUINAL NERVE : This is most at risk when the external obligue is is first opened to isolate the spermatic cord. Injury leads to numbess at the root of the penis, the side of the scrotum and a variable area of upper medial thigh.
2. ILIOHYPOGASTRIC NERVE : This nerve lying above the canal is vulnerable when a relaxing incision is made in the anterior rectus sheath.
3. GENITOFEMORAL NERVE.

In general, when these nerves are severed, an area of numbness is almost always complained; this invariably settles in months. If these nerves are damaged (or) stretched, they should be clearly divided and ligated to prevent regenerative penetration of adjacent mesodermal scar tissue and neuroma formation.

(iv) Severance of Testicular Blood supply

Even if the main artery of testis, Testicular artery is interrupted, atrophy of the testis does not occur because of extensive collateral circulation at the upper end of the testis between the branches of the vesical and prostatic arteries and internal spermatic and vas differential arteries. Preserve this collateral circulation by avoiding dissection of the testis from the scrotum during hernial repair.

(v) Injury to the Intestine

(i) During suture placement during high ligation of the sac of an indirect hernia.

(ii) During repair of a sliding Hernia.

(vi) Injury to Urinary Bladder

The medial side of a direct Inguinal Hernia often contain a sliding portion of the Bladder wall.

It may be injured during dissection.

If injured, close the defect in two layer with interrupted absorbable sutures and perform indwelling catheter drainage for a week.

(vii) Femoral vein compression

This can occur if sutures (or) prosthesis are placed too far laterally in repair of a femoral hernia (or) in a Cooper's Ligament type repair of an inguinal hernia. It is also at risk of being snagged during repair of the fascia transversalis to the iliopubic tract / antr. Femoral sheath during both Inguinal & femoral hernia repair.

Edema of lowerlimb and pulmonary embolus could be in the presenting signs of femoral vein compression.

Diagnosis can be confirmed by phlebography (or) venous Duplex scanning.

Treatment : Reopen and Removal of the offending suture.

POST OPERATIVE COMPLICATIONS

General : This include

i) Anesthetic complications

ii) Respiratory complications – Atelectasis, Pneumonitis

iii) Thrombophlebitis

iv) Urinary Retention

Reported by upto 30% of male patients in postoper period. Common in older men with enlarged prostate. Other causes of retention include

Use of preoperative atropine like drugs

Excessive postoperative analgesia

Reflex sphincter spasm due to incisional pain.

Management, is by simple methods such as Early mobilization, Upright posture, standing by a running water tap, Hot formentation. However if retention persists once – only Catherisation is adviced before the bladder becomes too distended.

Local

1. **Scrotal Ecchymosis**

Causes

Dissection of Blood from Inguinal canal into scrotum following the path of the spermatic cord due to inadequate Hemostasis.

It resolves spontaneously within few weeks

2. **Swollen Testis**

Causes

1. Tissues of the deep ring are closed too tightly about the cord
2. Interruption of venous and lymphatic vessels during dissection
3. Thrombosis of the pampiniform plexus

Collaterals eventually develop and the swelling subsides – meanwhile support the testis and restrict patient activity.

3. Testicular Atrophy

More prone to occur after repair of an indirect complete scrotal Hernia due to

1. Interruption of Testicular blood supply
2. Tight hernial repair about the cord.

Prevention is by careful non traumatic dissection of the cord, preservation of venous and lymphatic drainage and avoiding dissection of Testis and distal portion of spermatic cord

4. Hydrocele

Causes

1. Leaving a portion of the distal hernial sac insitu.
2. Interruption of lymphatic (or) venous drainage

Open the lower portion of the remaining sac. antertiorly downwards as far as possible and excise the margins.

Usually requires no treatment. If troublesome simple aspiration with a syringe.

5. Wound complications

The complications of open hernioplasty wounds are

a) Bruising b) Hematoma c) Sepsis d) Sinus formation

Incidence

In primary hernial repair 1%

In Recurrent hernial repair 3%

If wound healing is compromised, sepsis may involve the fascial repair with persistent sinuses (or) more extremely with failure of repair.

Early Recognition of wound infection, reopening of the wound to permit drainage.

Systemic antibiotics and appropriate local care.

6. Neuroma

Causes :

i) Accidental injury to the nerve and leaving the ends without ligation.

ii) Accidental entrapment of the nerve.

7. Missed Hernia

This is one that was present but unrecognized at the time of a primary hernial repair and that subsequently appears as a new hernia.

During repair of an indirect inguinal hernia, an associated direct hernia (or) a femoral hernia may be missed.

8. Recurrence

The causes are broadly divided into two groups.

I. Technical failure at the time of operation (or)

II. Tissue failure over the years after surgery.

Incidence : After Indirect Hernia Repair : 1.7%

After Direct Hernia Repair : 4- 10%

After Recurrent Hernia Repair : 5- 35 %

Recurrence from a laparoscopic repair varies from 0 to 16%.

MATERIALS AND METHODS

The clinical material for this study consists of 50 cases who were admitted and operated for complicated groin Hernia in various surgical units in Thanjavur Medical College during the period February 2005 to February 2006.

The patients under study were admitted from casualty with complaint of a groin swelling and associated features of its complication. Those patients who were admitted to have a irreducible hernia initially but become reducible on performing the maneuver of 'Taxis' were excluded from the study.

In the admission ward, useful history regarding the duration of swelling, duration of irreducibility, history suggestive of obstructive and systemic disturbances were carefully ilicited from the patients (or) their attenders. If the swelling was recurrent, history about the previous operative procedure was ascertained. Enquiries were made about the co-morbid medical illness and about personal habits.

The patients vitals were recorded with emphasis on mental status and degree of dehydration. Examination of the groin swelling carried out in detail and subsequent abdominal examination to rule out obstruction and peritonitis. The patients were thoroughly screened for any predisposing factors viz. per rectal examination for stricture, prostatic enlargement (or) growth; abdomen

examn. for ascites; Respiratory system examination for chronic Respiratory Tract infection.

Routine Investigations like Urine analysis, Blood Hb%, Blood sugar and urea, Serum creatinine and electrolytes, Xray chest and ECG were done for anesthetic purposes. Plain X-ray Abdomen Erect to detect fluid levels was done in cases of suspected obstruction.

As the reports were awaited, initial resuscitation of these patients with Intravenous fluids, analgesics, prophylatic Broad spectrum antibiotics and nasogastric decompression (in pts with abdominal distension), and Bladder Catherisation (to monitor urine output) carried out. The patients were taken for emergency Hernia repair once the results arrived.

The choice of anaesthesia was influenced by the patient's general condition. Most of them were carried out in regional anaesthesia – spinal (or) epidural while few required general anaesthesia. During operation, the site of constriction carefully noted and released, the contents were inspected for viability and appropriate decisions taken. Those with doubtful and nil viability were resected and anastomosis to adjacent viable bowel done. Hernia repair was followed using methods like Darning, Modified Bassini, Mesh repair using nonabsorbable suture material viz 1-0 prolene. Drain was kept in flank in cases where resection anastomosis was done.

Postoperatively, the patients were given parenteral antibiotics for 3 days. Drains were removed on 3rd Post operative day when there was bowel sounds and minimal collection. Patients were discharged on 5th POD while those with resection. anastomosis were observed up to 10 days in the hospital. Though most patients returned for suture removal only 10% of total patients reported for further followup. A case of recurrence was reported during the study.

OBSERVATION AND RESULTS

1. AGE INCIDENCE

< 35 YRS		35 - 50 YRS		51 - 70 YRS		> 70 YRS	
M	**F**	**M**	**F**	**M**	**F**	**M**	**F**
8	-	13	6	18	3	1	2
TOTAL 8		**19**		**21**		**2**	

The incidence of complicated groin Hernia were notably higher in the older age group, a large number belonging to 5^{th} and 6^{th} decade. This reflected the lack of attention to groin swelling in elderly people. Significantly about 8 young adults were admitted with complicated groin Hernia.

2. SEX INCIDENCE

	MALE	**FEMALE**
INGUINAL	40	1
FEMORAL	-	9
TOTAL	**40**	**10**

With regard to sex incidence, the majority (40 cases) were males and it is also evident that all had a complicated inguinal Hernia. Females predominantly encountered complicated Femoral Hernia (about 9 cases) while one female had inguinal type.

3. TYPE OF GROIN HERNIA

PRIMARY	**46**
RECURRENT	**4**

INGUINAL	**41**
FEMORAL	**9**

Our study showed that most of these Hernia were primary and only 4 of the patients had a recurrent swelling. Most of the patients had inguinal Hernia in accordance to the literature. About 9 pts had complicated femoral Hernia; all of them females.

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4. LATERALITY OF GROIN HERNIA

	RIGHT	**LEFT**
INGUINAL	27	14
FEMORAL	7	2
TOTAL	**34**	**16**

In our study, the complicated groin hernias were predominantly Right sided. Totally 34 pts had right Hernias of them 27 cases being inguinal and 7 cases femoral. Right sided Hernias accounted for 68% of the total cases. There were no bilateral complicated Hernia cases in our study.

5. COMPLICATION OF GROIN HERNIA

	OBSTRN.	**STRANG.**	**IRRED/INCAR**
INGUINAL	23	9	9
FEMORAL	7	2	-
TOTAL	**30**	**11**	**9**

Our study revealed that obstruction was the important complication occurring in the groin Hernia. About 30 cases (23 inguinal and 7 femoral) had features of obstruction viz. abd distension, vomiting, constipation and visible intestinal peristalsis. 11 of the patients presented with features of strangulation; severe groin pain and evidence of peritonitis in abdomen. Incarceration / Irreducibility was seen in 9 cases.

6. INTESTINAL OBSTRUCTION CASES

CAUSE	NO. OF CASES
OBSTRUCTED EXTERNAL HERNIAS	
Inguinal	23
Femoral	7
Epigastric	3
Incisional	2
ADHESIONS / BANDS	16
TUMOURS	7
ILEAL STRICTURE	6
SIGMOID VOLVULUS	5
TUBERCULOSIS ABDOMEN	4
INTUSSUSCEPTION	4
ILEO SIGMOID KNOTTING	2
OTHERS	2
TOTAL	**81**

The study revealed that obstructed groin hernias were the commonest cause of small bowel intestinal obstruction admitted during the study period. About 37% (30 cases) of small intestinal obstruction were due to obstructed groin hernias.

7. ANAESTHESIA

SPINAL	37
EA	6
GA	7
TOTAL	**50**

Most of the emergency surgeries undertaken in our study were carried out under spinal anaesthesia. 7 cases Required general anaesthesia which was influenced by the patient's general condition and the duration of operative procedure. 6 patients underwent surgery under epidural anaesthesia.

8. SITE OF CONSTRICTION

NECK OF SAC	34
EXTERNAL RING	13
ADHESIONS/OTHERS	3
TOTAL	**50**

Careful observation in our study revealed that neck of the sac was the ultimate site of constriction in 34 cases. External ring of Inguinal canal was the site of constriction in 13 of complicated inguinal Hernias. Adhesions and other causes contributed to irreducibility in 3 pts in our study.

9. CONTENTS OF SAC

ILEUM ALONE	38
ILEUM, CECUM, APPENDIX	6
SIGMOID COLON	4
OTHERS	2
TOTAL	**50**

In the study, it was noted ileal loops alone was the content of the sac – in most cases; being it inguinal or females totalling 38 cases,ileum along with adjacent cecum & appendix was the content in 6 cases. Sigmoid colon was content in Left sided Inguinal Hernias in 4 cases in our study. Omentum was content in 1 case and transverse colon along with omentum was content in 1 case

10. PEROPERATIVE PROCEDURE

REDUCTION	38
RESECTION & ANASTOMOSIS	11
APPENDICECTOMY	4
ORCHIDECTOMY	4
OTHERS	3

The decision about the peroperative procedure to be carried was made on looking at the viability of the contents. Reduction was done in 38 cases who had viable bowel while resection of the nonviable bowel and subsequent anastomosis of the normal bowel segment carried out in 11 cases. . Appendicectomy was additionally carried out in 4 cases and and orchidectomy in another 4 cases.

11. METHOD OF REPAIR- INGUINAL HERNIA

DARNING	21
MODIFIED BASSINI	18
MESH	2
TOTAL CASES	**41**

After Reduction (or) Reduction and anastomosis, repair of the postr. wall of Inguinal canal was carried out by Darning in 21 cases, Hernia repair by modified Bassini's Technique was undertaken in 18 cases while 2 cases had prosthetic mesh repair.

12. APPROACH FOR FEMORAL HERNIA

LOTHEISSEN	6
MCEVEDY	3
TOTAL CASES	**9**

Approach to complicated Femoral hernia was made thro' Trans inguinal (or) Lotheissen's procedure in 7 cases while the remaining two patients, the high approach of Mc Evedy was carried out to tackle the Femoral Hernia.

13. POST OPERATIVE COMPLICATIONS

WOUND SEPSIS	7
BLADDER DISTENSION	6
UTI	5
OTHERS	1
EXPIRED	2

In our study : wound sepsis (7 cases) and Bladder distension (6 cases) were the predominant complications encountered by the pts in the immediate postoperative period. Significantly 5 pts had Urinary Tract infection; most of them females in the postoperative period. 2 patients expired in the post operative period; the cause being septicemia in both cases.

ANALYSIS AND DISCUSSION

The major complications of groin hernia identified in this study include irreducibility, obstruction and strangulation.

The majority of patients who were admitted as emergencies with complicated groin hernias have not sought previous medical attention or been diagnosed with the condition in the out patient department. This observation implies that most hernias that develop complications do so within a relatively short time in the natural history of the disease. In adults, Gallegos estimated the cumulative probability of strangulation for inguinal hernia is 2.8% after three months, rising to 4.5% at the end of 2 years.

Thus, patients with a short history of Inguinal hernia should be operated earlier than those with longer histories to prevent complications.

Obstructed Groin Hernia have been the most common cause of small bowel obstruction in patients attending the emergency department for the same. This is evident from the study that out of total 81 patients admitted and diagnosed as a case of small intestinal obstruction during the study period obstructed groin Hernias contributed to a total of 30 patients (37 %). This is in marked contrast to the western series where adhesions and Bands top the frequency chart of causes of intestinal obstruction.

Old age is a significant risk factor for a complicated hernia. The age incidence derived from this study projects out the fact that peak incidence of complications occur in the 5^{th} and 6^{th} decade of life. Associated co-morbid illness like chronic obstructive pulmonary disease, prostatism, abdominal ascites & malignancy also contribute to the higher incidence in old age.

There is marked male predominance in the occurrence of complicated groin Hernia. But it is noteworthy to mention that Femoral Hernia is more common in the Female patients in our study ; almost all of the cases in accordance with the literature. The sex ratio in our study is 4 : 1

Inguinal Hernia is the most common type of Groin Hernia as evident from the study. All of the complicated Inguinal Hernias had an indirect sac.. In view of its indirect course, it does not often reduce itself spontaneously when the patient lies down and is more prone to irreducibility than the direct inguinal variety. Direct inguinal hernia was never encountered in the study.

Most of the presented hernias were of the primary variety. Only 4 cases presented with a recurrent groin swelling with evident complication. In our study it is highlighted that Right sided hernias, regardless of type are more common than left. This is no doubt associated with the later descent of the

right testis and a higher incidence of failure of closure of processus vaginalis. Bilateral cases were never encountered during the period of study, although literatures give a 12% Bilaterality.

Obstruction of bowel content in the sac remains the most common complication of the groin hernias in the study accounting to about 60% of total cases. Strangulation is the most serious complication of groin hernias. This occurs more frequently with neglected incarcerated hernias with advanced age, and in large hernias with relative small openings.

Initial Resuscitation was effectively done in all patients who presented with obstruction and strangulation of contents. The systemic effects of strangulation, as well as other incidental conditions such as diabetes mellitus, arrythmias, electrolyte imbalance were treated as intensively as possible in the short time available. Preoperative Broad spectrum antibiotics were given to all who showed signs of obstruction and peritonitis.

The emergency procedure were carried mostly in regional anaesthesia which included spinal anaesthesia in 37 cases and epidural in 6 cases.Cases who showed features of peritonitis preoperatively and those with prolonged duration of surgery than expected were operated under general anaesthesia.

One of the patient did not recover from general anaesthesia, was in ventilator for 36 Hours and subsequently expired.

Negotiating the site of constriction was the main step in emergency hernia surgery. In order of frequency, the constricting agent is a) the neck of the sac b) the external inguinal ring especially in children c) adhesions within sac (rarely). The study also showed that the neck of sac was the most frequent constricting agent. Most of the incarcerated / irreducible hernias had adhesions within the sac as the constricting agent.

Observation from the study showed that the ileal loops was the predominant content of the opened up hernial sac. 6 cases of right sided hernias had adjacent caecum and appendix along with the ileal loops. These cases preoperatively had large hernial sac with narrowing of neck at the deep inguinal Ring. The viability of the contents of hernial sac were carefully inspected during the procedure. Those with viable bowel loops (or) omentum were simply reduced back to peritoneal cavity.

In about 11 cases of strangulated bowel, resection and end to end anastomosis was done. Laparotomy was proceeded in two of these cases as the hernial opening was narrow and the bowel loops could not be sufficiently exteriorized. Laparotomy was done thro midline incision. Drains were kept for

a period of 48 hours. Appendicectomy was carried in those cases (4 in number) where appendix was found as a content of sac. Orchidectomy was done in 4 of the older patients to facilitate efficient repair and prevent recurrence.

The choice of the method of Hernia repair rests on the surgeon. Neither procedures shared significant advantage over others if done properly. Recurrence in a patient who underwent darning was mainly due to wound sepsis during immediate postoperative period. Prosthetic mesh was used only in 2 cases for Hernia repair; the reasons being to avoid the incidence of wound infection in emergency situation and the non-availability of mesh during late hours in our institution.

Many of the surgeons employed the Trans inguinal approach of Lotheissen to deal with the obstructed femoral hernia. The neck of these sacs were exposed by incising the posterior inguinal canal. The femoral canal was closed by suturing the conjoint Tendon to the iliopectineal line using three non absorbable sutures. Tanner's muscle slide was done when there was any Tension. Strangulated femoral Hernia were dealt thro High approach of McE vedy , as this gave immediate access to the peritoneal cavity.

Wound sepsis and Bladder distension remained the most common complaints of patients in immediate postoperative period. Five of the six cases who presented with bladder distension had preoperative finding of prostatic enlargement and hence they required bladder catherisation. They were adviced to undertake further treatment in Urology Department after discharge. Urinary tact infection was reported in five cases which responded well to the Urinary antiseptics.

Two patients who underwent resection and anastomosis for strangulated bowel expired. Both died due to overwhelming septicemia. They presented with gross peritonitis at the time of admission. One of these cases was on ventilator for 36 hours following failure to recover from anaesthesia. The mortality rate in our study is henceforth 4%.

Although most of the patients came for suture removal after a week of surgery, only 5 patients came for followup (about 10%). One came with recurrence and another with stich abscess. The offending suture material was removed.

CONCLUSION

1. The major complications of groin hernia in our study included irreducibility, obstruction and strangulation.
2. Obstructed groin hernia remains the most common cause of small intestinal obstruction, admitted in emergency department.
3. Most of the complicated groin hernias occur in old aged people. Males out number female in overall incidence. Femoral Hernia is commoner in females.
4. Primary indirect Inguinal Hernia were the most common type of hernia in the study.
5. Right sided Hernias are more common than left regardless of the type of Hernia.
6. Obstruction of the bowel in the hernial sac is the most commonly presented complication.
7. Neck of the hernial sac was the most common constricting agent causing complication.
8. Ileal loops were the most common content of the hernial sac.
9. Initial resuscitation was instituted in all cases of strangulation which helped in smooth preoperative course and smoother postoperative recovery.

10. Choice of Hernia repair was decided on patient's requirement and surgeon's preference. No significant advantage was made one over another
11. Wound sepsis and Bladder distension were the chief postoperative complications encountered by the operated cases.

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PROFORMA

NAME AGE/SEX OCCUPATION

INCOME MARITAL STATUS

UNIT IP NO

DOA DOS DOD

ADDRESS

PRESENTING COMPLAINTS

HISTORY OF PRESENT ILLNESS

DURATION OF SWELLING SIDE OF OCCURENCE DURATION OF IRREDUCIBILITY

HISTORY SUGGESTIVE OF OBSTRUCTION

PAIN OVER THE SWELLING ABDOMINAL PAIN VOMITING

ABDOMINAL DISTENSION CONSTIPATION OBSTIPATION

SYSTEMIC SYMPTOMS

FEVER OLIGURINA THIRST

H/O CHRONIC COUGH H/O ABDOMINAL MASS

H/O DIFFICULT DEFECATION H/O DIFFICULT MICTURITION

H/O PREVIOUS SWELLING

PRIMARY OR RECURRENT

IF RECURRENT

TIME OF ONSET AFTER PREVIOUS OPERATION TIME OF PREVIOUS OPERATION

NATURE OF PREVIOUS OPERATION POST OPERATIVE COMPLICATIONS IF ANY

H/O PREVIOUS SURGERY

PREVIOUS MEDICAL ILLNESS

ASTHMA DIABETES HYPERTENSION TUBERCULOSIS

PERSONAL HISTORY

SMOKING ALCOHOL USE OF TRUSS

CLINICAL EXAMINATION

GENERAL EXAMINATION

MENTATION	TEMPERATURE	PULSE
PALLOR	B.P.	HYDRATION

LOCAL EXAMINATION

INSPECTION

SWELLING

SIZE

SITE	INGUINAL	FEMORAL
SIDE	RIGHT	LEFT

EXTENT

TYPE	REDUCIBILE	IRREDUCIBLE
COUGH IMPULSE		SKIN OVER HERNIA
ASSOC HYDROCELE		ANY PREV SCARS

PALPATION

PRESENCE OF WARMTH	PRESENCE OF TENDERNESS	PRESENCE OF TENSENESS

REDUCIBLE OR IRREDUCIBLE

INCARCERATED	INFLAMED	OBSTRUCTED	STRANGULATED

PERCUSSION

AUSCULTATION

ABDOMINAL EXAMINATION

ABDOMINAL DISTENSION	VISIBLE INTESTINAL PERISTALSIS

SIGNS OF PERITONITIS

GUARDING	RIGIDITY	BOWEL SOUNDS

RESPIRATORY SYSTEM

CARDIOVASCULAR SYSTEM

CENTRAL NERVOUS SYSTEM

SPINE DEFORMITIES

PR EXAMINATION	BPH	GROWTH

INVESTIGATIONS

URINE	COMPLETE BLOOD COUNT

ALB

SUGAR

BLOOD SUGAR	BLOOD UREA	SERUM CREATININE
SERUM ELECTROLYTES	Na	K

PLAIN CHEST X RAY	PLAIN ABDOMINAL X RAY

ECG

DIAGNOSIS

OPERATIVE PROCEDURE

TYPE OF ANAESTHESIA LA REGIONAL GA

SITE OF CONSTRICTION

NECK OF SAC S I RING ADHESIONS WITHIN SAC

CONTENTS OF SAC

VIABILITY OF CONTENTS

METHOD OF REPAIR

INGUINAL MIDIFIED BASSINI DARNING SHOULDICE MESH

FEMORAL

SUTURE MATERIAL NYLON PROLENE CHROMIC CATGUT

PER OPERATIVE PROCEDURES ADOPTED

RESECTION & ANASTAMOSIS FUNICULECTOMY

ORCHIDECTOMY APPENDICECTOMY

PER OPERATIVE DIFFICULTIES

BLEEDING SLIDING HERNIA ADHESIONS

BOWEL INJURY BLADDER INJURY INJURY TO NERVES

INJURY TO VAS DEFERENS OTHERS

POST OPERATIVE PERIOD

LOCAL COMPLICATIONS

BLADDER DISTENSION HEMATOMA SEROMA

SWOLLEN TESTIS WOUND SEPSIS TESTICULAR ATROPHY

NEURALGIA OTHERS

GENERAL COMPLICATIONS

ANESTHETIC

GENITOURINARY

PULMONARY

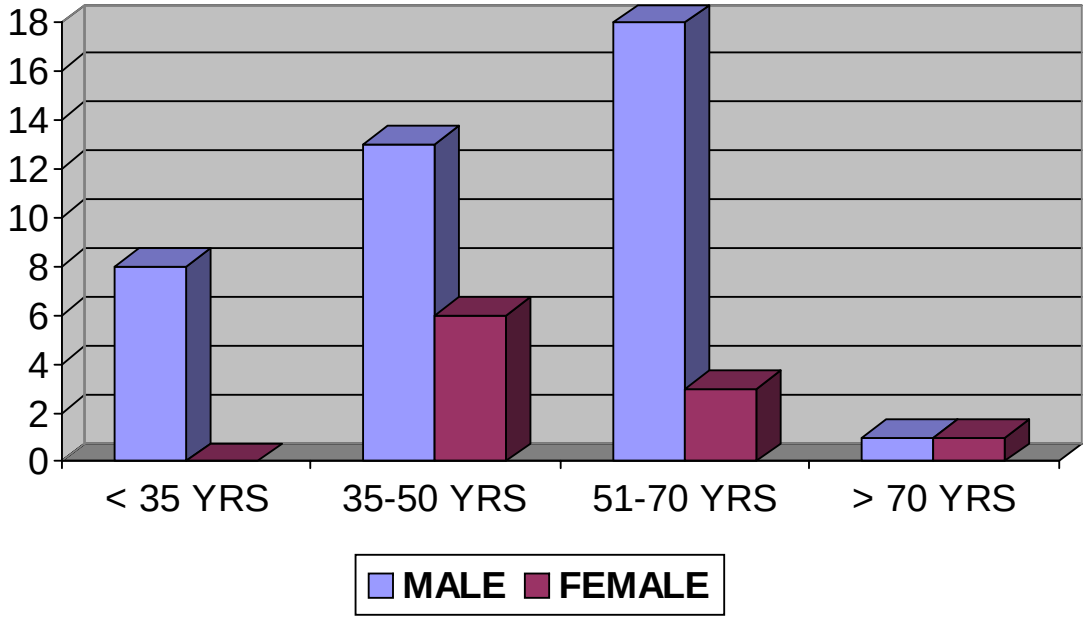
PHLEBOTHROMBOSIS

FOLLOW UP

RECURRENCE SEPSIS/STITCH ABSCESS KELOID

MORTALITY

1. AGE INCIDENCE



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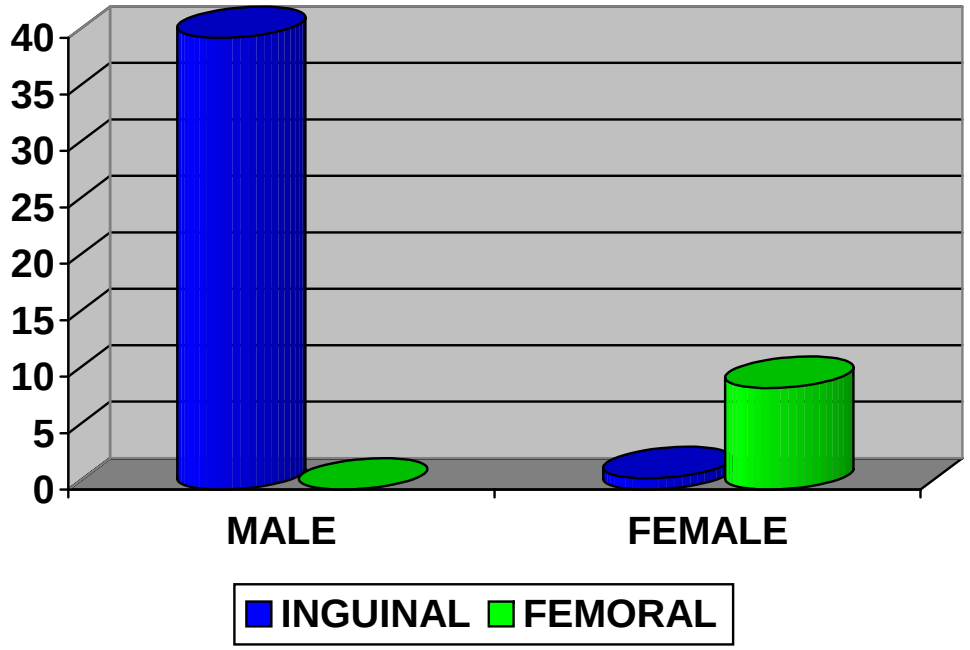

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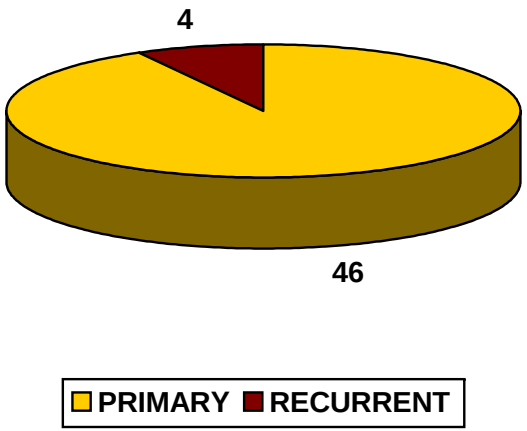

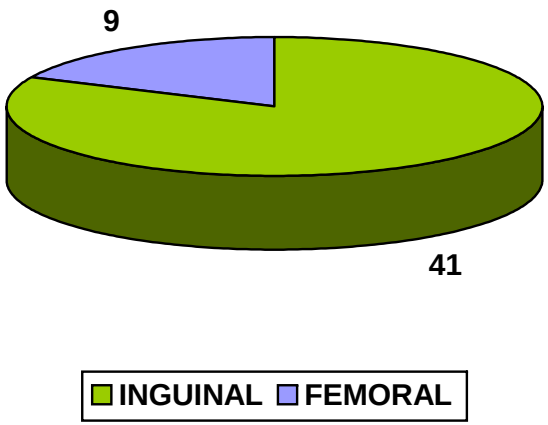

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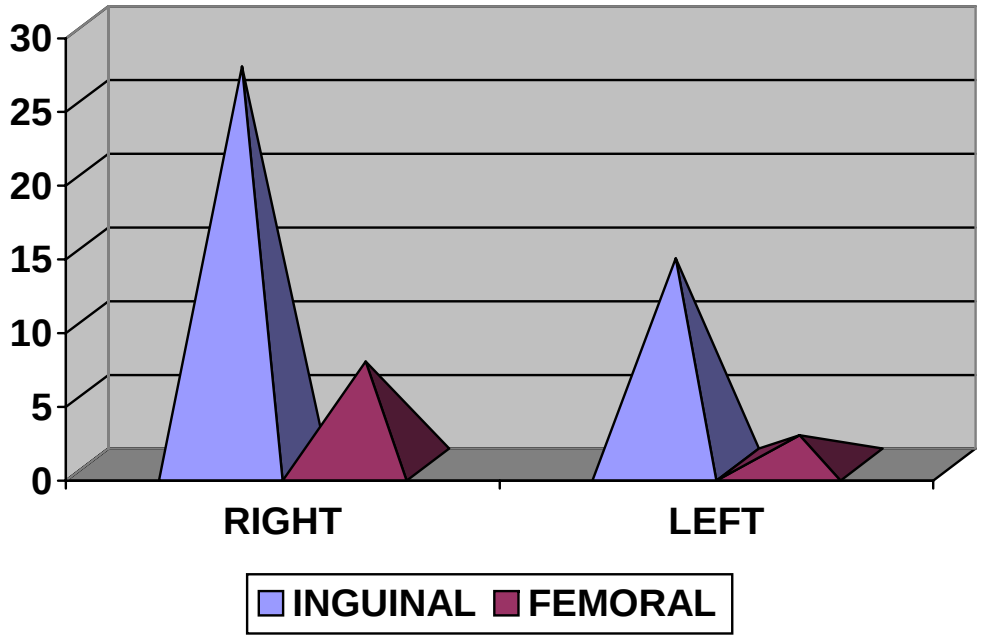
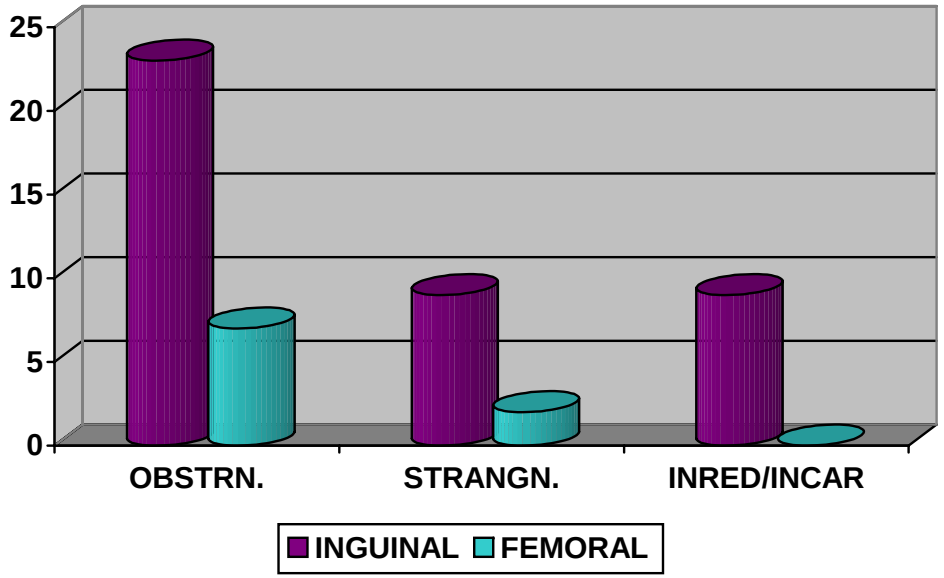


5. COMPLICATION OF GROIN HERNIA



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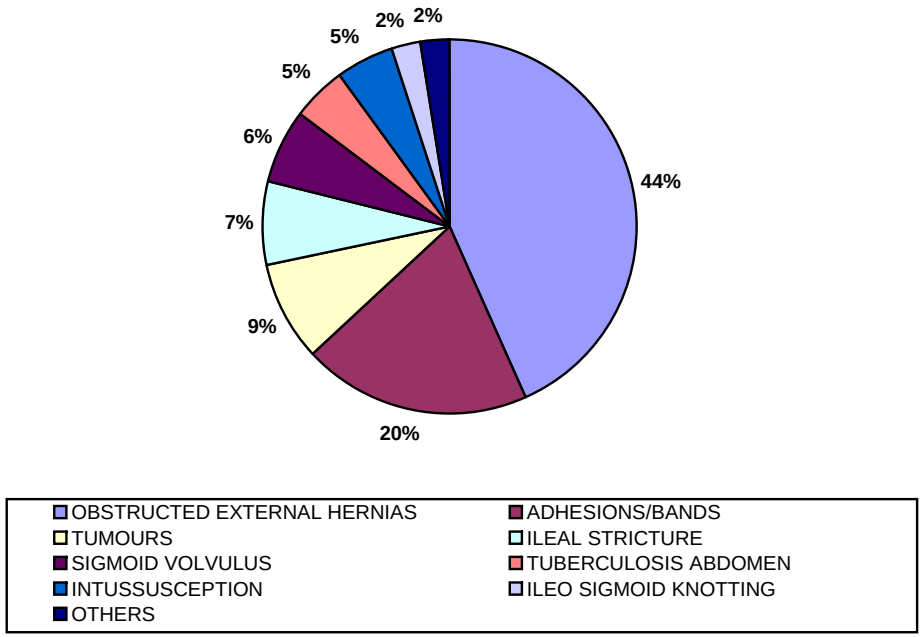

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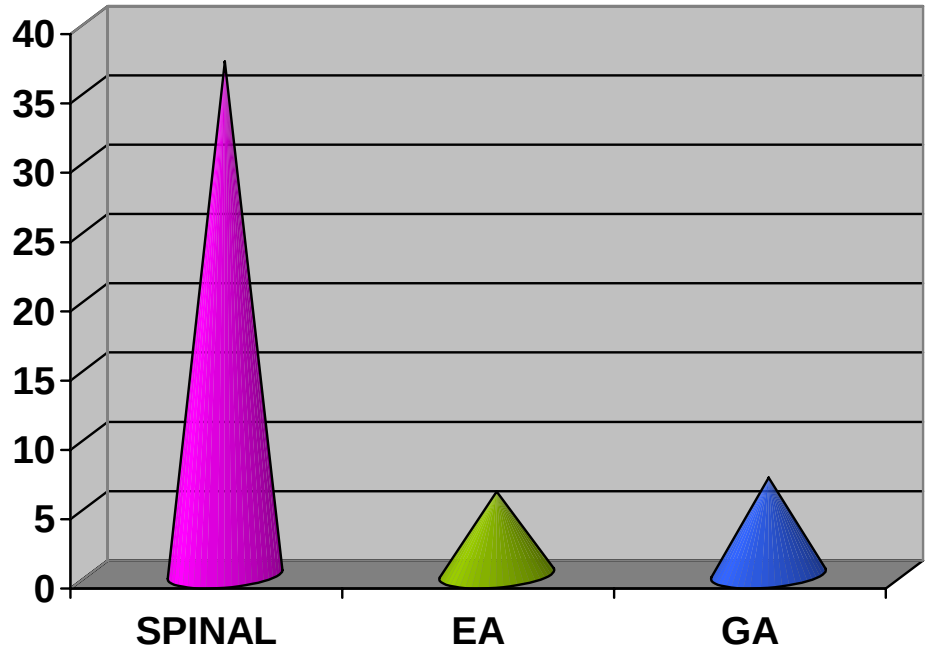
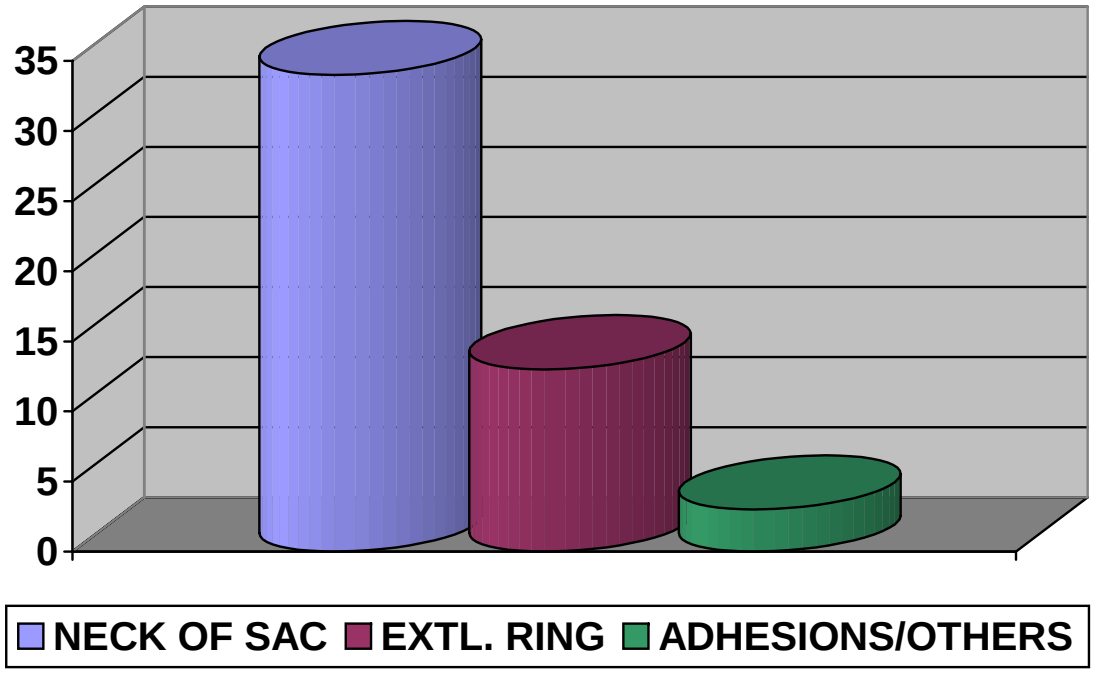
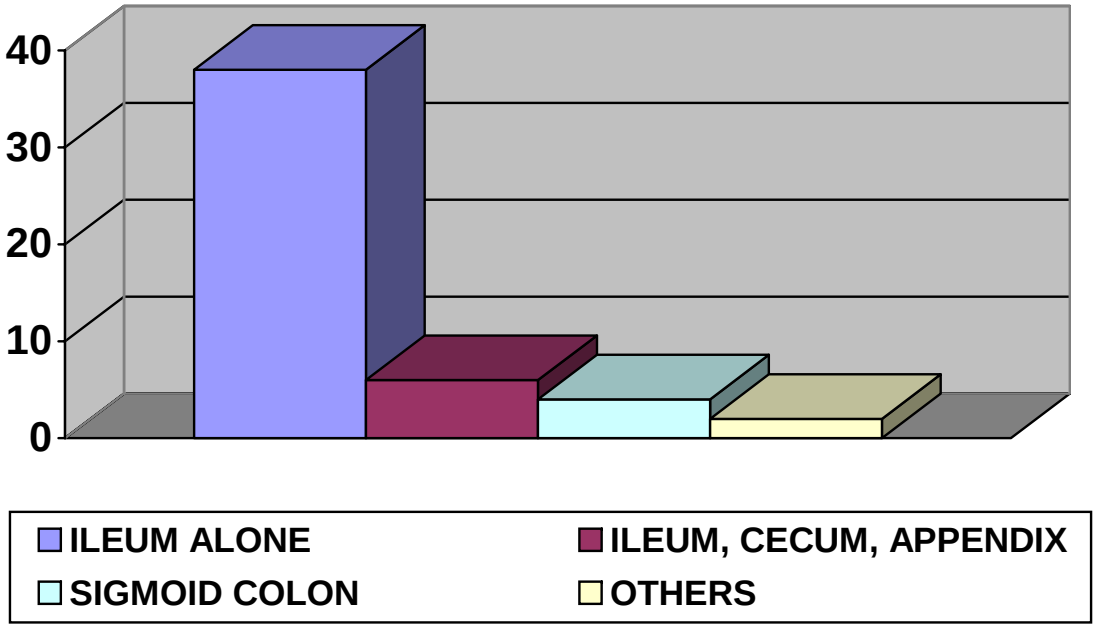


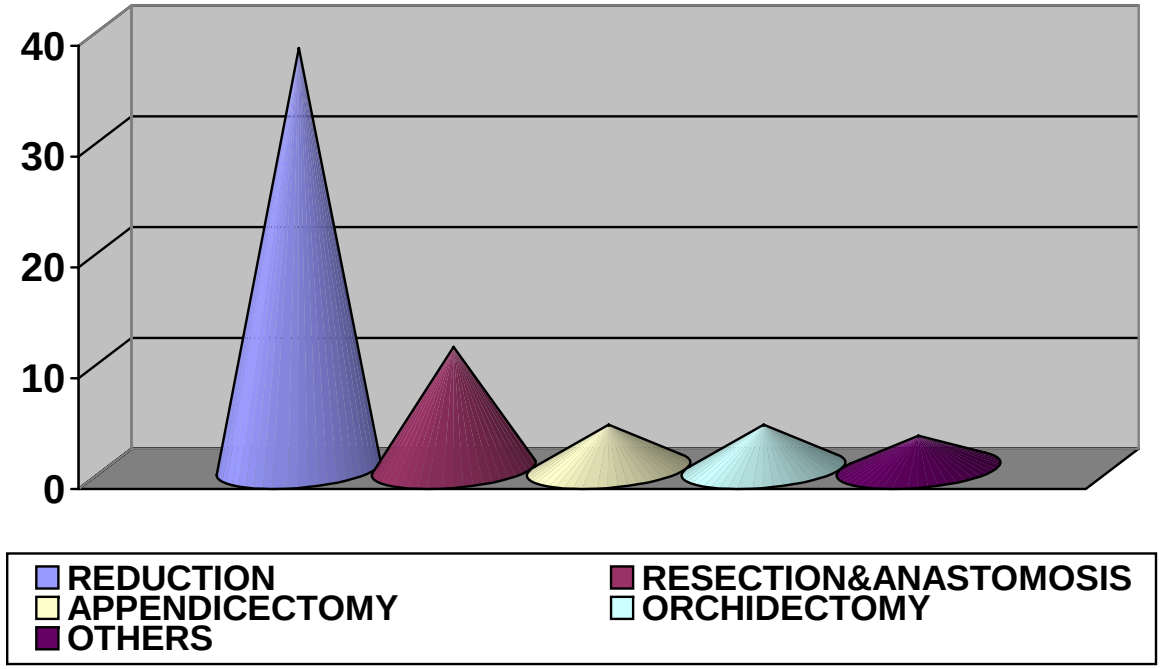
8. SITE OF CONSTRICTION



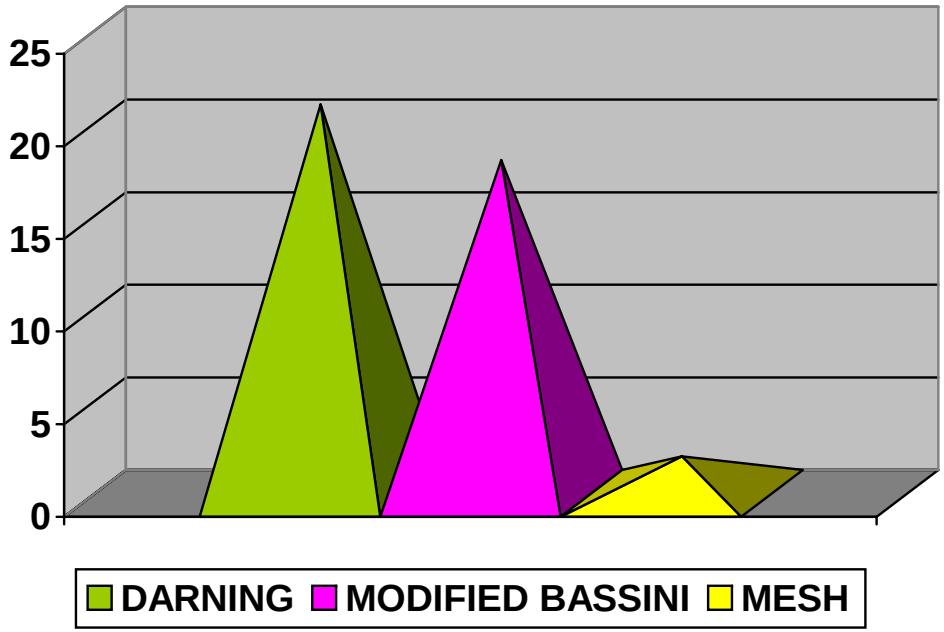
9. CONTENTS OF SAC



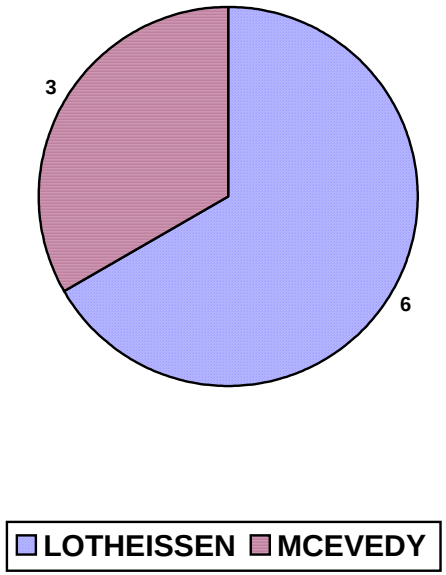
10. PER OPERATIVE PROCEDURE



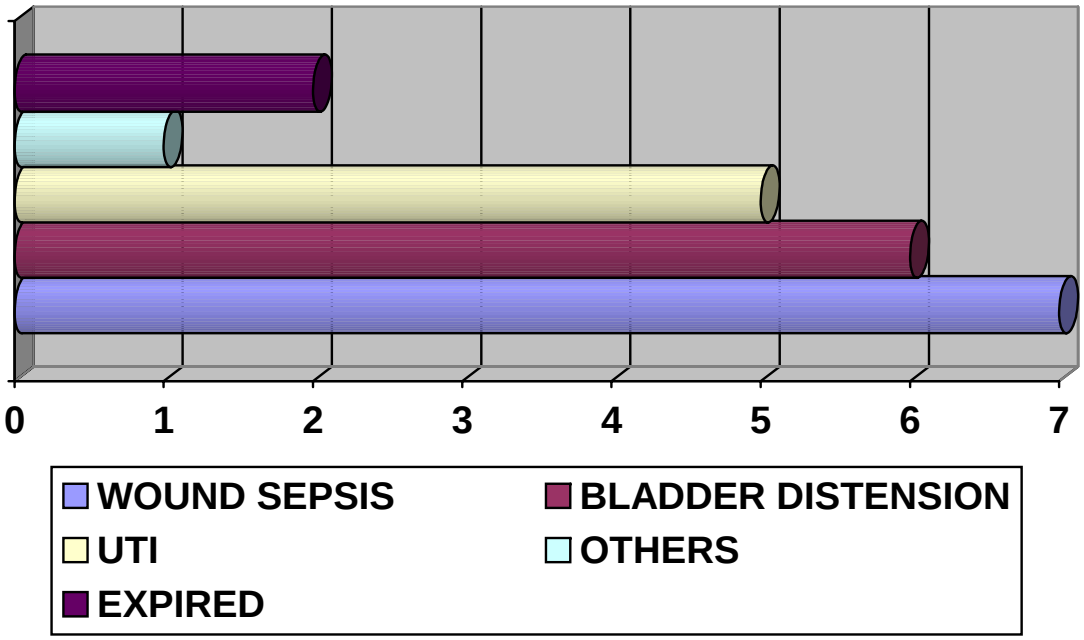
11. METHOD OF REPAIR - INGUINAL HERNIA



12. APPROACH FEMORAL



13. POST OPERATIVE COMPLICATIONS



MASTER CHART

S. No.	Name	Age / Sex	IP No	Unit	Date of Surgery	Diagnosis	Anes-thesia	Site of Constriction	Contents of SAC	Per Operative Procedure	Method of Repair	Post Operative Complications	Follow up
1.	NALLAMMAL	45 F	831987	S I	13.02.05	OBST. ® FEMORAL	SA	NECK OF SAC	VIABLE ILEAL LOOP	REDUCTION	FEMORAL RING OBLIT (LOTHEISSEN)	-	
2.	MAHALINGAM	45 M	835670	S III	09.03.05	OBST. ® INGUINAL	SA	NECK OF SAC	VIABLE ILEAL LOOP	REDUCTION	MODIFIED BASSINI	-	
3.	PANEERSELVAM	45 M	836284	S II	29.03.05	STRAN (L) INGUINAL (REC)	SA	NECK OF SAC	GANG RENOUS ILEAL LOOPS	RESECTION & ANASTOMOSIS	MESH REPAIR	WOUND SEPSIS	
4.	PITCHAIMUTHU	60 M	837890	S II	05.04.05	STRAN ® INGUINAL	EA	NECK OF SAC	GANGRENOUS ILEAL SEGMENT AND CECUM	RESECTION, ILEO – ASC. COLON ANASTOMOSIS	DARNING	BLADDER DISTENSION	
5.	VEDHAIYAN	60 M	837971	S III	08.04.05	OBST ® INGUINAL	SA	ETXL.RING	VIABLE CECUM & APPENDIX	APPENDICECTOMY REDUCTION	DARNING	UTI	
6.	ACHIKANNU	35 F	838487	S I	10.04.05	OBST ® FEMORAL	SA	NECK OF SAC	VIABLE ILEAL LOOP	REDUCTION	FEMORAL RING OBLIT (LOTHEISSEN)	-	
7.	KAMALAKANAN	26 M	838907	S V	15.04.05	OBST ® INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	-	
8.	MANI	19 M	839902	S VI	23.04.05	IRRED ® INGUINAL	SA	EXTL. RING	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI		
9.	AMMAYAPPAN	48 M	839557	S III	24.04.05	0BST ® INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	DARNING	WOUND SEPSIS	RECURRENCE JAN'06
10.	SOUNDARAJAN	60 M	841637	S VI	07.05.05	IRRED (L) INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	MESH REPAIR	BLADDER DISTENSION	
11.	SIVAKUMAR	55 M	841670	S VI	07.05.05	0BST ® INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	DARNING	UTI	
12.	KUMARESAN	45 M	841818	S VI	08.05.05	0BST (L) INGUINAL	SA	EXTL. RING	VIABLE ILEUM	REDUCTION BIL. EVERSION OF SAC	MODIFIED BASSINI	-	

13.	VENKATACHALAM	70 M	844474	S VI	28.05.05	IRRED (L) INGUINAL	EA	EXTL RING	VIABLE SIGMOID COLON	REDUCTION	DARNING	BLADDER DISTENSION	
14.	AKILANDAM	60 F	845154	S IV	03.06.05	0BST ® REMORAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	FEMORAL RING OBLIT (LOTHEISSEN)	-	
15.	MUTHULAKSHMI	42 F	845172	S IV	03.06.05	0BST (L) INGUINAL	SA	ADHESIONS	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	-	
16.	SUNDAR	51 M	841621	S II	07.06.05	0BST ® INGUINAL	SA	NECK OF SAC	VIABLE TR.COLON & OMENTUM	REDUCTION ® ORCHIDECTOMY	DARNING	WOUND SEPSIS	STICH ABSCESS DEC '05
17.	VEDANATHAN	28 M	847087	S I	14.06.05	STRAN ® INGUINAL	GA	NECK OF SAC	GANGRENOUS ILEAL SEGMENT	RESECTION & ANASTOMOSIS	MODIFIED BASSINI	RTI	
18.	RAJENDRAN	50 M	847234	S III	15.06.05	IRRED (L) INGUINAL	SA	ADHESIONS	VIABLE OMENTUM	REDUCTION	DARNING	-	
19.	AYYASAMY	50 M	850280	S II	10.07.05	STRAN ® INGUINAL	EA	NECK OF SAC	GANGRENOUS ILEAL SEG.	RESECTION & ANASTOMOSIS	DARNING	WOUND SEPSIS	
20.	VEERAIYAN	55 M	851118	S III	17.07.05	IRRED (L) INGUINAL (REC)	SA	EXTL. RING	VIABLE SIGMOID COLON	REDUCTION	MODIFIED BASSINI		
21.	PARAMASIVAM	52M	852334	S II	25.07.05	OBST ® INGUINAL	SA	NECK OF SAC	GANGRENOUS OMENTUM VIABLE ILEUM	OMENTECTOMY ® ORCHIDECTOMY	DARNING	-	WOUND SITE PAIN
22.	MANIKANDAN	18 M	852587	S IV	29.7.05	STRAN ® INGUINAL	GA	NECK OF SAC	GANGRENOUS ILEAL SEG.	RESECTION & ANASTOMOSIS ® ORCHIDECTOMY	MODIFIED BASSINI	-	
23.	PAULRAJ	40 M	853135	S IV	02.08.05	OBST ® INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	-	
24.	ARUMUGAM	49 M	856973	S III	30.08.05	OBST ® INGUINAL	SA	EXTL. RING	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	UTI	
25.	SAHUBAR SATHIK	30 M	857569	S III	01.09.05	OBST ® INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	-	
26.	MANI	34 M	858882	S II	13.09.05	OBST ® INGUINAL	SA	EXTL RING	VIABLE CECUM, INFLAMED APPENDIX	APPENDICECTOMY REDUCTION	MODIFIED BASSINI	-	

27.	KASINATHAN	68 M	860297	S IV	29.09.05	STRAN (L) INGUINAL	GA	NECK OF SAC	GANGRENOUS ILEAL SEG.	RESECTION & ANASTOMOSIS	MODIFIED BASSINI	WOUND SEPSIS	
28.	KUMAR	32 M	861661	S II	06.10.05	STRAN ® INGUINAL	EA	NECK OF SAC	GANGRENOUS ILEAL SEG.	RESECTION & ANASTOMOSIS	MODIFIED BASSINI	WOUND SEPSIS	
29.	ABDULLAH	28 M	862215	SII	11.10.05	IRRED (L) INGUINAL	SA	EXTL RING	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	-	
30.	PAUNAMBAL	40 F	862509	S IV	13.10.05	OBST ® FEMORAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	FEMORAL RING OBLIT (MCEVEDY)	-	WOUND SITE PAIN
31.	CHINNAYAN	55 M	862480	S IV	16.10.05	OBST ® INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	DARNING	UTI	
32.	DANASINGH	76 M	863708	S III	26.10.05	OBST ® INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	DARNING	BLADDER DISTENSION	
33.	NARASINGAM	70M	863714	S III	26.10.05	OBST (L) INGUINAL	GA	EXTL RING	VIABLE ILEUM & CECUM	APPENDICECTOMY REDUCTION	DARNING	BLADDER DISTENSION	
34.	GOVINDARAJ	65 M	864364	S III	02.11.05	OBST (L) INGUINAL	SA	NECK OF SAC	VIABLE SIGMOID	REDUCTION	DARNING	-	
35.	SAMIKANNU	50 M	864847	SVI	05.11.05	STRAN (L) INGUINAL	GA	NECK OF SAC	GANGRENOUS ILEAL SEG.	RESECTION & ANASTOMOSIS	DARNING	EXPIRED SEPTICEMIA	
36.	VEMBU	63 F	865260	S IV	10.11.05	STRAN ® FEMORAL	EA	NECK OF SAC	GANGRENOUS ILEAL SEG	RESECTION & ANASTOMUSIS	FEMORAL RING OBLITER (MCEVEDY)	UTI WOUND SEPSIS	NO COMPLAINTS
37.	RAJASEKAR	35 M	865631	S I	14.11.05	OBST ® INGUINAL	SA	EXTL. RING	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	-	
38.	KARUPPAIYAN	60 M	866160	S V	18.11.05	OBST ® INGUINAL BIL.HYDROCELE	EA	NECK OF SAC	VIABLE ILEUM	REDUCTION BIL. ORCHIDECTOMY	DARNING	-	
39.	MARIAMMAL	39 F	868471	S V	09.12.05	STRAN ® FEMORAL	SA	NECK OF SAC	GANGRENOUS ILEAL SEG	RESECTION & ANASTOMOSIS	FEMORAL RING OBLITERATION (MCEVEDY)	-	
40.	LAKSMI	50 F	868306	S IV	08.12.05	OBST ® INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	DARNING	-	
41.	THANGARAJ	56 M	868598	S VI	11.12.05	OBST (L) INGUINAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	DARNING	-	

42.	MANICKAM	55 M	869789	S III	21.12.05	IRRED ® INGUINAL	SA	EXTL RING	VIABLE ILEUM	REDUCTION	DARNING	-	
43.	KASIYAMMAL	75 F	870204	S VI	29.12.05	OBST (L) FEMORAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	FEMORAL RING OBL (LOTHEIS SEN)	WOUND SEPSIS	
44.	RAVICHANDRAN	35 M	870780	S II	03.01.06	OBST (L) INGUINAL	SA	NECK OF SAC	VIABLE CECUM ILEUM	APPENDICEC TOMY REDUCTION	MODIFIED BASSINI	-	
45.	THOMAS	54 M	871295	S II	03.01.06	STRAN ® INGUINAL	EA	NECK OF SAC	GANGREN OUS ILEAL SEG & CEACUM	RESECTION ; ILEO- ASC. COLON ANAS TOMOSIS	DARNING	EXPIRED SEPTICEM IA	
46.	AMBALAVANAN	35 M	871864	S IV	08.01.06	OBST ® INGUINAL	SA	EXTL. RING	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	-	
47.	THAULATH BEEVI	35 F	872872	S II	17.1.06	OBST ® FEMORAL	SA	NECK OF SAC	VIABLE ILEUM	REDUCTION	FEMORAL RING OBLITE (LOTHEI SSEN)	-	
48.	PONNAN	60 M	875085	S VI	03.02.06	INCAR ® INGUINAL	SA	ADHESIONS	VIABLE ILEUM	REDUCTION	DARNING	BLADDER DISTENSI ON	
49.	NARAYANANASAMY	55 M	876609	S III	15.02.06	IRRED (L) INGUINAL (REC)	SA	EXTL RING	VIABLE ILEUM	REDUCTION	MODIFIED BASSINI	-	
50.	BAKYAM	68 F	865694	S I	14.11.05	OBST (L) FEMORAL	GA	NECK OF SAC	VIABLE ILEUM WITH TEAR	ILEAL TEAR CLOSURE REDUCTION	FEMORAL RING OBLIT (LOTHEISSE N)	-	